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HILDRETH ^{Rev. Dr.} (E. A. L.)

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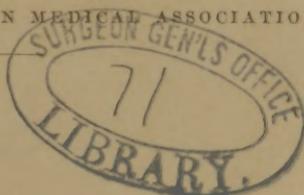
ON

TOPOGRAPHY, CLIMATOLOGY, AND EPIDEMIC
DISEASES OF WEST VIRGINIA.

BY

E. A. HILDRETH, M. D.
WHEELING, WEST VIRGINIA.

EXTRACTED FROM THE
TRANSACTIONS OF THE AMERICAN MEDICAL ASSOCIATION.



PHILADELPHIA:
COLLINS, PRINTER, 705 JAYNE STREET.
1868.



REPORT

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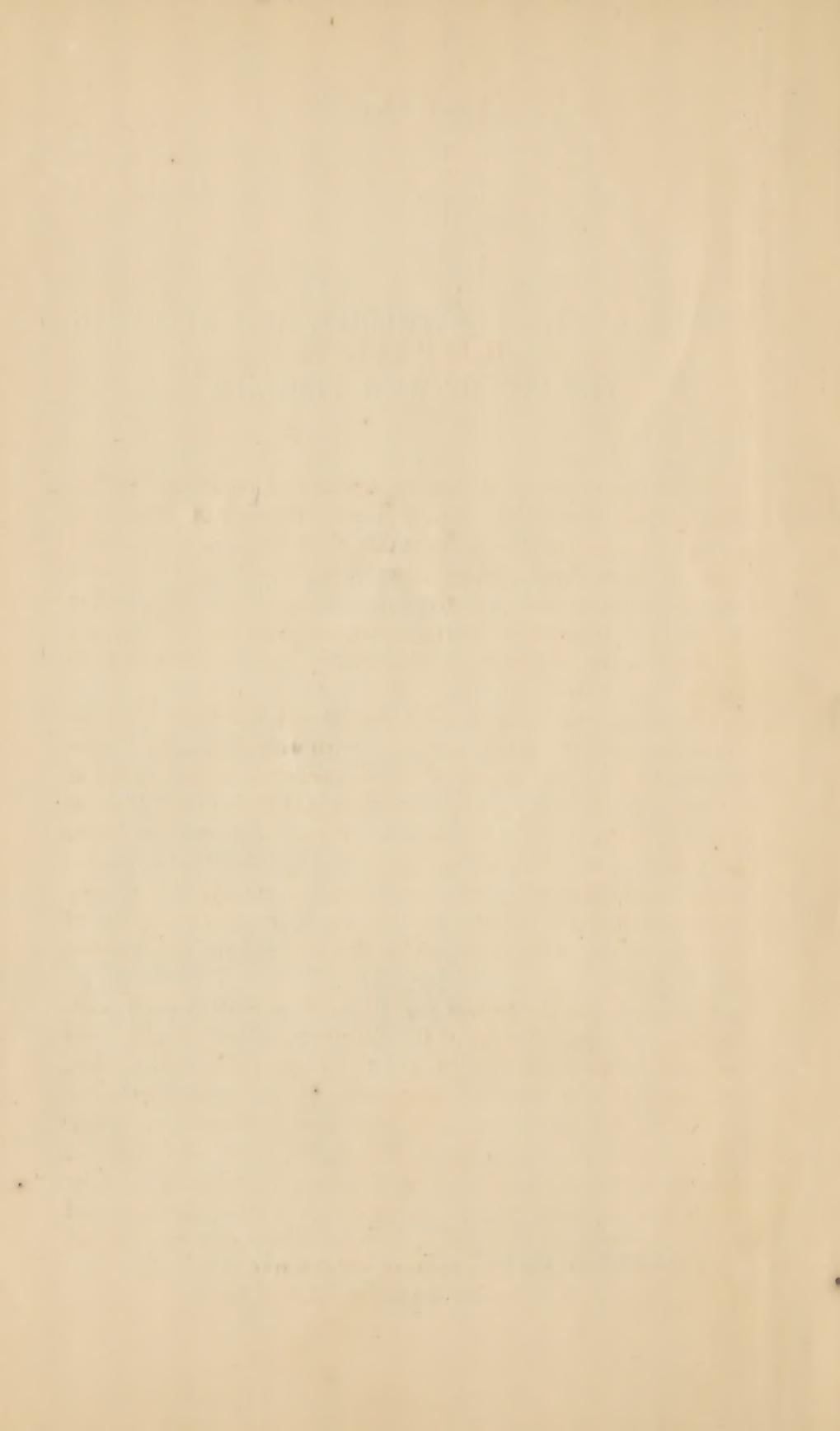
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R E P O R T.

YOUR Committee, in attempting the task of reporting "on the Topography, Climatology, and Epidemic Diseases of West Virginia," have used all the means within their reach, meagre as they are. With a view to obtain information we addressed a printed circular to physicians in nearly every county in the State, asking reports, and answers to interrogations, and have received but two or three replies. It must be remembered that our State is, so to speak, in its infancy.

Physicians practising in the rural districts (and these comprise three-fourths of the whole) are so occupied with their daily routine of practice, and their powers of physical endurance are so taxed, as to leave little leisure time for observing, and noting such facts, as ought to be embodied in this report. Whilst all of the older States have made a thorough geological survey by competent and experienced geologists, who, under the patronage and pay of the State, have executed full reports thereof, we have merely reports of several counties in the southeastern part of the State, by Professor W. B. Rogers.

The number of the present population of the State is purely conjectural. At the outbreak of the Rebellion in 1861, no portion of the country was more divided, and discordant, down to dissension, and separation of families; many went to the South, and never returned. During the war, and since, there has been a rapid and increasing influx of population and capital, a life, and vigorous growth, which will rapidly bring the State to maturity. Under late laws a correct system of "registration of births, marriages, and deaths" has been inaugurated; but its machinery has scarcely had time to move, much less to produce reliable results.

The State Medical Society is just one year of age.

The State of West Virginia presents an almost unexplored field to the climatologist, naturalist, geologist, mineralogist, botanist, schoolmaster, and missionary; more inviting and profitable than any other State in the Union.

There are many parts of West Virginia where its people have lived for the last forty years with every surrounding necessary to their comfort, perfectly satisfied with their situation; behind the present age of progress and improvement, and strongly opposed to the Yankee plan of pushing a railroad or turnpike through their farm, with a mistaken idea of improving it. Probably in consequence of this policy, in part, the people of West Virginia cannot boast of a single foot of railroad built by themselves, and but one or two turnpike roads. But a bright and glorious future is just dawning upon her, and she will, ere long, take her position among the first in wealth and population in the sisterhood of States.

The American Medical Association will please accept this apology, for the following report:—

The State of West Virginia was admitted into the Union 20th June, 1863, with a population, according to the Census of 1860, of 376,688.

Taking into account the changes since that period, her present population may fairly be estimated at 400,000.

The new State was formed from the western part of Virginia, and is divided into fifty-two counties; situated between latitude $37^{\circ} 3'$ and $40^{\circ} 35'$ north, longitude from $77^{\circ} 41'$ to $82^{\circ} 45'$ west.

Its area is 19,350,578 acres, or $30,235\frac{1}{4}$ square miles. Its boundaries are, on the east, Virginia and Maryland; the south, Kentucky and Virginia; the west, Ohio; the north, Maryland and Pennsylvania.

It is a hilly and mountainous country. The eastern line is along the western ridge of the Alleghany range, formed of the Cheat, Great Greenbrier, and Briory, and its southern by the Flat-top Mountains.

The general course of this range is northwest and southeast. West Virginia is the western declivity of this range of mountains; a great water-shed discharging into the Ohio River. Along the mountain tops are plateaus of many miles in extent, similar to the prairies in the west; descending towards the west are the "glades," extending at many points almost to the Ohio River; further south and west, running to the limits of the State, the mountain range becomes irregular and broken by the Kanawha River and its

branches, having apparently cut their way directly through the soft sand rock of which this range is mostly formed, showing a perpendicular face of from five hundred to one thousand feet, as at "Hawk's Nest", in Fayette County, on New River; along the Ohio valley to the northern limit, the hills present a sharp and abrupt outline, with short ranges seemingly abutting into each other.

The following measurements of altitude will convey a better idea of their position.

The elevations along the line of the Baltimore and Ohio Railroad above the sea level are¹—

	Feet.
Ohio River at Moundsville	637
Cabin Point Tunnel	950
Fairmont	850
Tvgart's Valley (within mt's)	1000
Kingwood Tunnel	1750
Summit	2620
Cheat River Valleys	1375
Blue Ridge near Harper's Ferry	1800
Across the southern portion of the State, Ohio River at Kentucky line	550
Kanawha River at Charleston	600
Mouth of Greenbrier River	1333
Plateau of White Sulphur Springs	2000

The greatest elevation is in Pocahontas County, being about 3000 feet.

GEOLOGY.—On this subject we can present a mere outline from Lyell's Elements:—

"The parallel zones of the Appalachians consist of strata folded into a succession of convex and concave flexures, subsequently laid open by denudation. The component rocks are of great thickness, all referable to the Silurian, Devonian, and Carboniferous formations.

"There is no principal or central axis, no nucleus to which all the minor ridges conform; but the chain consists of many nearly equal and parallel foldings, having what is termed an anticlinal and synclinal arrangement.

"Sometimes the whole assemblage of ridges runs perfectly straight for more than 50 miles, after which all of them wheel around altogether and take a new direction at an angle of 20 or 30 degrees to the first." "The important feature in the above section is the

¹ Surveys.

great coal field underlying the whole State and running towards the west, the various seams being laid open by the Monongahela, Ohio, and Kanawha Rivers cropping out along their banks and hillsides."

"The great limestone seam in the northwestern part lies below the coal measures, cropping out in the mountain sides. Interspersed with the coal measures are corresponding veins of iron ore of nearly all the varieties and forms of the hematite class found in the Alleghany range. These ores are found in strata pure or intermingled, ranging from one to four feet in thickness, yielding about 33 per cent. of iron. (H. Hagans.) The rocks along the Kanawha valley are chiefly sandstone of various qualities lying in strata or beds from two inches to several feet in thickness. These strata are nearly horizontal, but dipping to the northwest, imbedded in them, are four seams of coal above the water level within a vertical distance of 240 feet, the aggregate thickness of which is 17 feet."

The minerals to be found in West Virginia are, coal, iron, lead, copper, silver, antimony, nickel, lime, borax, alum, salt, and fire-clay. The whole State is underlaid with coal cropping out of the hill-sides and along the valleys and banks of nearly every creek and river in the State, appearing as if the water-courses had divided the mountains and hills from top to base, exposing their rich veins of coal, iron, limestone, etc., rendering their mining and transportation easy and cheap. *There is coal enough in West Virginia to pay the national debt, principal and interest.*

Prof. W. B. Rogers reports: "At Clarksburg and northward, down the valley of the Monongahela, there exists one of the richest coal deposits in the State; one of the seams is from 10 to 12 feet thick, below which lie thinner strata of more highly bituminous character. In Hampshire County, upon a stratum of valuable iron ore not less than 15 feet in thickness, there rests a bed of sandstone, upon which repose a coal seam 3 feet thick, above this another bed of sandstone, then a two feet vein of coal, then sandstone, then another coal seam of 4 feet; again a stratum of sandstone, and over it a seven feet vein of coal; over this a heavy bed of iron ore, and crowning the series an enormous coal seam of from 15 to 20 feet in thickness. On the Great Kanawha the exposure of coal is one of the most extensive and valuable anywhere in the United States." In this part of the State the hills and mountains, as you ascend the river from Charleston to Gauley Mountains,

present strata lying nearly level, of gray, brown, red, and white sandstone (the latter highly fossiliferous), clay slate, clay and sandy shales, iron ore and limestone; intermingled with these strata are seams of coal of the cannel, splint, and bituminous varieties, having an aggregate thickness of over 60 feet. A modern writer described the State in one word, when he said it was a *coal'd* country.

It would require a volume to describe the "oil region" lying in Ritchie, Wirt, and Wood Counties.

HYDROGRAPHY.—West Virginia abounds in rivers, creeks, and valleys; from either side of the mountain plains spring the fountain heads of most of the rivers—the great source being in Pocahontas and Randolph Counties, where the West Fork, Tygart's Valley, and Cheat Rivers unite to form the Monongahela. The general course of these rivers is north, along the valleys of the Alleghany Mountains. Describing a wide circuit through western Pennsylvania the Monongahela unites with the Alleghany to form the Ohio River. Next is the Little Kanawha, its main branches rising in Upshur and Randolph Counties, running southwest, emptying into the Ohio at Parkersburg. Looking to the southwestern part of the State are the Pocotalico, Coal, Elk, and Gauley Rivers, rising in the Great Flat-top Mountains in Roane, Raleigh, Randolph, and Pocahontas Counties, with New River taking its rise in North Carolina and Tennessee, all of which unite to form the Great Kanawha, and empty into the Ohio.

The Guyandotte and Big Sandy Rivers, both of whose headwaters interlock with the Clinch and Holston amid the spurs of the Cumberland Mountains, run a westerly course and discharge into the Ohio. "In their passage to the Ohio they traverse the most wild and picturesque region to be found in West Virginia; abounding in immense hills of sand rocks, cut into deep ravines by the water-courses, containing caverns of various sizes and extent. This region was formerly the most famous hunting-ground for bears in all the country. In 1805, 1806, and 1807, eight thousand skins were collected by hunters from this district. It was the paradise of bears, where, amid the forests of chestnuts and oaks, they found their food in exhaustless abundance."¹

The Ohio River forms the entire western boundary of the State,

¹ Dr. S. P. Hildreth, Marietta, Ohio.

extending a distance of 253 miles. It has an average width of about 450 yards. It is the great commercial outlet, having direct communication with the Mississippi River, into which it empties, bearing on its placid bosom thousands of water-craft, from the floating palace of a thousand tons' burthen to the tiny skiff. Its fall, in the length of the State, is about two feet two inches per mile, and the rate of its current is from two to four and a half miles per hour.

Such is a general description of our rivers. Creeks, "forks," runs, and rivulets innumerable course over the face of the State. All of the rivers have from their source a rapid descent, assuming the character of torrents in passing through narrow defiles or rocky passes, until they reach, in the valleys below, more nearly the level of the Ohio, when they subside to quiet placid streams.

MEDICINAL WATERS.—The mineral springs of West Virginia are numerous and celebrated. We have blue, white, and red sulphur, salt, and salt sulphur springs; some of them are old places of resort for the sick, fashionable, nervous, and broken down—many and wonderful are the cures reported to have been wrought by their healing waters. A general account of the most noted may not be uninteresting.

The *White Sulphur*, of Greenbrier County, "is situated nine miles east of Lewisburg, six or eight miles from the top of the Alleghanies, on the western declivity, in an extensive valley embosomed with hills and mountains." "It was well known to the Indians as an important 'lick' for deer and elk." (*Howe's Hist.*) The following is an analysis of its waters. 100 cubic inches contain of solid matter 63.54 grains, composed of—

Sulphate of lime,	Peroxide of iron,
" magnesia,	Phosphate of lime,
Chloride of magnesia,	Sulphate and hydrate of sodium,
" sodium,	Precipitated sulphur, iodine, and organic
" calcium,	matter.

Temperature 62° Fahr.

The gaseous contents are—

Sulphuretted hydrogen,	Nitrogen,
Carbonic acid,	Oxygen.

"Its remedial virtues are applied to diseases of the liver, kidneys, digestive organs, rheumatism, scrofula, etc." (Prof. Rogers.)

The analysis of the *Blue Sulphur*, in the same county, is as follows:—

Sulphate of lime,		Chloride of calcium,
" magnesia,		Hydrosulphate of sodium and magnesium,
" soda,		Protosulphate of iron,
Carbonate of lime,		Iodine,
" magnesia,		Sulphur,
Chloride of magnesia,		Organic matter.
" sodium,		

Gaseous contents—

Carbonic acid,	Nitrogen,
Oxygen,	Sulphuretted hydrogen.

This spring furnishes fifteen gallons of water every minute—red, white, and black deposits are thrown down from its waters.

The *Red Sulphur Springs* are situated on Indian Creek, Monroe County. The water clear and cool—temperature 54° Fahr.—strongly charged with sulphuretted hydrogen and neutral salts. Its qualities are alterative, sedative, diuretic, diaphoretic, and anthelmintic.

The *Salt Sulphur Springs* are three miles from Union Village, Monroe County. In this vicinity are also the Sweet Sulphur and New Spring—the last contains a large portion of iodine. Temp. 49° to 56° Fahr. Analysis as follows:—

GASEOUS CONTENTS.							IN 100 CUBIC INCHES.	
Sulphuretted hydrogen	.	.	.	.	.	.	cubic inches,	1.10 to 1.50
Nitrogen	.	.	.	.	.	.	"	2.05
Oxygen	.	.	.	.	.	.	"	0.27
Carbonic acid	.	.	.	.	.	.	"	5.75
SOLID CONTENTS.								
Sulphate of lime	.	.	.	.	.	.	grains,	36.755
Sulphate of magnesia	.	.	.	.	.	.	"	7.883
Sulphate of soda	.	.	.	.	.	.	"	9.682
Carbonate of lime	.	.	.	.	.	.	"	4.445
Carbonate of magnesia	.	.	.	.	.	.	"	1.434
Chloride of magnesium	.	.	.	.	.	.	"	0.116
Chloride of sodium	.	.	.	.	.	.	"	0.683
Chloride of calcium	.	.	.	.	.	.	"	0.025
Peroxide of iron from protosulphate	.	.	.	.	.	.	"	0.042
An azotized organic matter, blended with sulphur	.	.	.	.	.	.	"	4.000
Earthy phosphates and iodine	.	.	.	.	.	.	a trace.	

(Prof. W. B. ROGERS.)

The *Sweet Sulphur* is also in Monroe County, temperature 73° Fahr. In a quart there are—

Carbonic acid	grains, 12 to 15.	Carbonate of magnesia	grains, 18 to 24.
Sulphate of magnesia		Carbonate of lime	
Muriate of soda		Siliceous earth	
Muriate of lime		Iron	
Sulphate of lime			(ROUELLE.)

The waters are used as a bath and drank, in dyspepsia, chronic diarrhoea and dysentery, uterine and nephritic complaints.

The mountain counties all have mineral springs, many of which are untried and unexamined—they may also be found along the Ohio River.

The "Parkersburg Wells," in Wood County, have some reputation; containing neutral salts, with carbonic acid and sulphuretted hydrogen gases.

Berkley Springs, in Morgan County, although the waters are but slightly impregnated with mineral ingredients, are in high repute for many diseases.

Shannonlub Springs are in Jefferson County. Temperature 55° Fahr. 100 grains contain—

	Grains.		Grains.
Sulphate of lime . .	63.0	Muriate of magnesia . .	1.0
Carbonate of lime . .	10.5	Sulphate of iron . .	0.3
Sulphate of magnesia . .	23.5	Carbonate of iron . .	0.7

Gaseous contents—

Sulphuretted hydrogen,

Carbonic acid.

(DE BUTTS.)

It may be proper to insert here a general account of the salt wells of the State, found chiefly in Mason and Kanawha counties.

"The discovery of salt water in the latter county was by reason of a large 'buffalo lick' on the northeast side of Kanawha River, five miles above Charleston. The first well was sunk in 1809 in this 'lick,' known as the 'Big Lick.' Its salt waters were doubtless used by the Indians."

"The Kanawha Salt Works extend for about fifteen miles on both sides of the river above Charleston, giving employment to about 3000 persons, and yielding an annual product of about 1,200,000 bushels of salt. The salt water is obtained by boring at a depth of from 300 to 1000 feet below the bed of the river. The salt water in the wells invariably rises or falls to a level with the river, like the mercury in its tube."

"Connected with these 'fountains of strong brine,' and mingled with their waters, are 'fountains of inflammable gas,' sufficient to

pump it out in a constant stream, and then, by its combustion, to evaporate the whole into salt of the best quality." The gas is a mixture of carburetted and sulphuretted hydrogen, and is commonly found in the wells of about 1000 feet depth; yet it may be seen in many places bubbling up through the sand in the bottom of the river, and probably brings up the salt water with it, as in the gas wells, but in small quantity.

"The celebrated 'Burning Spring' is only one of its natural vents on dry land, the gas having forced its way from the rocks or coal bed below through seventy or eighty feet of alluvial earth to the surface. On applying a lighted torch, brilliant flames play and flash about over the surface of the water in a singular manner."

The same character of *burning springs* are found in other parts of the State, particularly in Wirt County, connected with the "oil or petroleum wells" of that region.

The salt wells of Mason County are principally along the banks of the Ohio River, yielding a similar quality of salt, with the same advantages of a seam of excellent coal cropping out in the adjacent hill-side, and used for evaporating the salt water.

Within my recollection, salt of a good quality was made from a well in North Wheeling; it was bored to a depth of 920 feet; although long since abandoned, it emits a stream of inflammable gas.

SOIL AND PRODUCTION.—The river bottoms of all the larger streams have a loamy soil, and yield rich returns to the husbandman; those along the Ohio River especially, having a width of from a few yards to two miles of level surface, are more easily cultivated, besides the facilities of transportation to market. It is a common practice, after the crops are gathered in the fall, for the old farmer and his sons to go to the woods, "get out" the timber, and construct their own "broad-horn," a flat boat, and, loading it with their farm products, embark for Cincinnati, Louisville, or New Orleans, where they sell both boat and cargo.

Corn, wheat, rye, oats, timothy, and esculents, are common crops. We have known 142 bushels of corn taken off one acre of ground, and twenty to twenty-five bushels of wheat is a customary yield. Fruits grow to great perfection, such as apples, pears, peaches, grapes, and strawberries. Tobacco, flax, and hemp are plentiful. The table lands along the summit of the Alleghanies, comprising a narrow belt of perhaps an average width of twenty miles, and the plateau towards the interior of the State, having mostly a clayey

and calcareous soil, are quite fertile. A recent writer¹ thus describes this region. "In a mountainous and hilly country such as this is, the natural inference is, that it is rocky, barren, cold, and untilable. The very reverse of this is true; the entire surface, with very few exceptions, mountain-top and hill-top, sides, and valleys are covered with a fertile soil capable of productive cultivation. In many localities in which a field of level land is unknown, and all is abrupt and almost precipitous, there is no sign of a gully, or evidence of washing visible, or a swamp, or pool of stagnant water; even the bottom of the 'sinks' or 'devil's punch-bowls,' which are hopper-like depressions, are sometimes 50 or 100 feet in depth. Such a region is that of Monroe and Greenbrier, green with luxuriant herbage, or umbrageous with heavy forests, with a natural drainage scarcely improvable by art, and showing the great value of thorough drainage in the promotion of health of man and beast.

"Even the steepest hill-sides are smooth as lawn and as green. Rocks may diversify the landscape, as an exception, but, as a universal rule, they repose unseen beneath the surface, and never disfigure the view or arouse the spleen of the ploughman.

"The *forests* of the State are made up of sugar-maple, poplar, beech, oak, chestnut, cherry, hickory, walnut, ash, elm, and sycamore. In the mountain counties are several species of pines; along the southern part the chestnut flourishes. In the valleys are the locust (*Robinia*) and buckeye (*Aesculus*, O.). The dogwood (*Cornus Florida*) selects the uplands. There are laurel and hazel thickets on the mountains. The undergrowth of the forests consists of young hickory and oak, redbud, papaw (*Anona*, G.), witch-hazel, black, and dewberry, and wild grape-vines.

"Over two-thirds of the area of the State, as soon as the undergrowth of the forests is cleared out sufficiently to allow the sun's rays to strike the soil, blue grass and white clover are the natural growths, and in many fields sown in timothy, these natural grasses displace it.

"On the mountain plateaus and 'glades' a coarse succulent grass covers the ground, often several feet in height, affording pasturage frequently until the middle of December; when cut and dried it makes the best of hay. Formerly the cane (*Arundinaria Macrospuma*) grew along the banks of Big Sandy River; this is its extreme northern limit."

¹ I. R. Dodge. West Virginia, its Farms, Forests, etc.

This hasty sketch is designed to enumerate the chief native growths of our State as indicative of her climatology; a full description would make a volume.

INHABITANTS.—The first settlers of West Virginia came chiefly from Eastern Virginia and Maryland, and were mostly of Scotch, English, and Irish descent. They were industrious, sagacious, hospitable, hardy, and self-reliant; their purpose was to secure a goodly number of acres of land, although their facilities were quite limited for cultivating it; yet their rule was to make a “clearing” sufficient to supply their household wants with corn and vegetables, and as the forests abounded with bears, deer, and wild turkeys, they did not want for provision to supply themselves and leave enough for a rough but generous hospitality. They were liberal and social, and lived an independent contented life. Their corn-husking, apple-peeling, and log-rolling parties answered the double purpose of friendly intercourse and mutual assistance.

Their cabins usually consisted of a single room about 25 feet square, built of logs, “chinked and daubed,” with a puncheon floor. With an enormous open fireplace on one side, opposite to which the beds were arranged next the wall, and a door on either side and half window for light, there was no want of ventilation. The large fire of wood afforded sufficient warmth and light for all domestic and social purposes.

Every family was supplied with a “hominy-block” and hand-mill to prepare their corn; the bolting-cloth was made of “deer-skin in the state of parchment, stretched over a hoop and perforated with a hot wire.”

They tanned their own leather and buckskin, and made their moccasins and shoes. “Their clothing was all of domestic manufacture,” wool and flax the material, and “linsey,” the warmest and most substantial of cloths, supplied their clothing, and the women did the tailor-work.

In many portions of the State there are still to be found fair representatives of pioneer life, who look at modern innovation of early customs and habits with distrust and suspicion, and the confinement and discipline of the schoolmaster as a needless and useless curtailment of liberty; scarcely to be endured in comparison with the physical energy induced by an unconstrained and free use of their limbs in a hunter’s life, so consonant with their feelings and habits. How much these innate ideas of independence and

freedom in its widest sense may have descended to the present generation would be difficult to determine, but, "Montani Semper Liberi" is the motto of the State of West Virginia.

About nineteen years ago a bill passed the legislature of Virginia authorizing the establishment of public schools in such counties as would vote a majority therefor; and among the counties of West Virginia, Ohio and Greenbrier, I think, were the only ones that accepted the law; but it affords great pleasure to state that, in the organization of the new State, a law was enacted for the establishment of public schools in every county and township in the State, and an abundant fund provided for their support and perpetuity. At this present writing, with a State but little over four years old, we have a system of common schools which will compare favorably with any other in the country.

The effect of the separation from Old Virginia, "whose malign influence has long rested like a nightmare upon this region, is easily seen by the stimulus given to industry and enterprise, the opening up of new channels of trade, the influx of population, and profitable investment of capital.

Sufficient has already been stated of the productions of the State to intimate that its inhabitants are good livers; besides the wild meats, hogs and cattle supply the best of corn-fed bacon and beef.

Every farmer expects to slaughter and cure sufficient hogs in the fall to last until the next season. Corn meal makes the universal bread, generally eaten in the shape of "Johnny cake" or "corn pone;" in many counties scarcely any wheat bread is used.

The present well-doing farmer has deserted the old log cabin of his ancestors, and built a commodious hewn log or framed and weather-boarded house, with enlarged and convenient out buildings. He usually has a good-sized family of industrious children, and, having few or none of his wants unsupplied, lives a contented and happy life.

There are two evils (and good seldom comes without), these are bad whiskey and tobacco.

The temperance reform has never abolished the decanter from the sideboard, and it is still a mark of friendship to tender a glass of whiskey-toddy or apple-jack.

A patch of tobacco is cultivated like corn, for family use: Virginia tobacco has a world-wide reputation. As these old habits and customs came from their ancestors down to the present genera-

tion, they are not likely to become changed, except by the influx of a preponderance of emigrants from other countries.

C^LIMATE.—On an examination of the isothermal lines, it appears that the line of a mean temperature of 52° traverses about the centre of the State; whilst the line of 55° passing through Baltimore and Washington city, bending along our southern boundary, passes through Northern Kentucky—a little south of Cincinnati—across the centre of Illinois to St. Louis, Missouri, so that we enjoy a climate free from the chilly blast of northern latitudes, and exempt from the parching and sultry heat in the States on the south.

Since the settlement of the Southern States, the springs and mountain air of Virginia have been the "El Dorado" of the southern mind, and the annual resort to recover health undermined by the malarial exhalations of a torrid sun.

A modern writer¹ says of the mountain counties:—

"For variety and fertility of soils, fine water power, central position, salubrious and delightful climate, beauty and grandeur of scenery in plain and on mountain, it can literally and with severity of truth be said to be unsurpassed, if equalled, in the United States: or as a farming region in which to make homes of comfort, opulence, and refinement."

With a position between the 37th and 40th degrees of north latitude, and an elevated point above the sea-level, so thoroughly and rapidly drained as to preclude any stagnant water or marshy exhalations, and a fresh, pure mountain air, we have none of the causes inducing malarial diseases, such as obtain in the States lying west and south of us.

The universal report of practising physicians in different parts of the State is, that, proportioned to the population, there is a less ratio of mortality than in any other part of the country. Nay more, that there are few new residents, or sojourners, particularly if from the Northern States, whose health, if not restored, is not decidedly improved.

It is not an uncommon experience of many of our citizens who, under the glowing descriptions of the *west*, and the cheapness of farms there, have been induced to emigrate thither; but under the powerful miasmatic influences of that country, their health is generally broken down, and after a short struggle with intermittents in

¹ L. R. Dodge. West Virginia, its Farms, etc.

summer and fall, and pneumonia in winter, the remnant of the family were almost sure to return, looking so lean and sallow as scarcely to be recognized by their friends, and feeling like the "discontented squirrel" of the fable, perfectly satisfied to return to the old homestead, and spend the remainder of their days.

Although some points along the eastern boundary, on account of their altitude and exposure, might be suggestive of hyperborean blasts and eternal snows in winter, and little warmth from the sun's rays in summer, such is far from the fact.

On this point, we quote a description of Pocahontas County, the most elevated in the State. (I. R. Dodge. *West Virginia, its Farms, etc.*)

"In their rough mountain heights, remote from railroads and navigable rivers, dwell three thousand nine hundred and fifty-eight hardy mountaineers, occupying eight hundred and twenty-eight thousand nine hundred and twenty-one acres in farms (less than one-tenth improved), worth two million fifty-one thousand seven hundred and eighty dollars. Sheep husbandry flourishes here, numbering ten thousand three hundred and thirty-eight animals, and cattle abound. Value of live stock, three hundred and twenty-eight thousand and two dollars. Of Indian corn, forty-eight thousand two hundred and twenty-nine bushels. Rye, ten thousand seven hundred and seventy-eight bushels. Wheat, eight thousand nine hundred and thirty-three bushels, etc. These few figures are given merely to show that the Alleghany Mountain-tops, among the most remote and inaccessible portions of West Virginia, do contain homes of comfort, plenty, and sturdy independence."

The following meteorological tables, taken in different portions of the State, and at different altitudes, are herewith submitted. Kanawha or Charleston, and Lewisburg from the Smithsonian Record; Wheeling from my own Register.

TABLE I.

Month.—1859.	Charleston, W. Va.			Lewisburg, W. Va.			Wheeling, W. Va.		
	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.
January . . .	62°	6	35°.14	62°	—2°	32°.55	55°	1°	30°.00
February . . .	66	18	41.69	64	13	38.40	60	16	35.72
March . . .	75	30	51.58	72	30	47.68	72	22	45.22
April . . .	80	31	53.98	85	25	51.96	72	24	45.60
May . . .	86	48	65.62	82	48	68.03	84	45	65.25
June . . .	91	42	68.51	90	38	69.93	92	37	64.35
July . . .	95	57	74.67	92	50	75.93	94	50	71.34
August . . .	92	52	73.38	92	60	74.33	90	45	70.34
September . . .	84	50	65.93	79	34	61.29	78	43	62.32
October . . .	80	25	50.99	69	20	48.35	70	30	48.16
November . . .	79	20	46.91	70	14	44.23	69	24	40.11
December . . .	76	17	34.97	71	5	33.33	69	3	30.00
Mean year . . .			57.78			53.83			50.70
Altitude . . .			600 ft.			1800ft.			640 ft.

Climatology of Taylor County for the year 1867.—By W. H. SHARP, M. D., Grafton.—The following statistics have been taken from observations made during the past year for the Department of Agriculture at Washington, and although imperfect, are respectfully submitted.

The average temperature for the year was 55°.48; the lowest mean average for year was for January, 24°.77; the highest mean was for August, 77°.18.

TABLE II.

Month.	Lowest point during month.	Highest point during month.	Lowest average for whole day during month.	Highest average for whole day during month.	Average for month at			Mean for month.
					7 A. M.	2 P. M.	9 P. M.	
January . . .	2°	52	7°.33	44°.66	19°.29	30°.12	24°.90	24°.77
February . . .	5	60	13.	54.66	34.78	51.60	41.03	42.47
March . . .	10	62	24.66	54.66	35.16	48.79	39.03	40.77
April . . .	30	82	40.	69.66	44.9	68.13	52.7	55.24
May . . .	45	90	50.	77.	55.76	68.12	58.	60.63
June . . .	56	94	70.	82.	68.70	84.11	72.05	74.95
July . . .	56	100	70.	83.33	69.45	85.89	76.12	77.15
August . . .	45	98	66.66	84.66	70.08	89.16	73.20	77.48
September . . .	45	96	56.66	82.	62.70	83.26	68.	71.33
October . . .	33	88	41.	68.66	47.77	69.93	54.87	57.52
November . . .	16	75	19.33	61.66	41.20	58.56	43.93	47.90
December . . .	6	59	11.	56.	33.91	38.93	33.93	35.60
Sums . . .					583.70	776.	637.82	665.79
Means . . .					48.64	64.66	53.15	55.48

TABLE III.—*Amount of Rain and Snow, &c., during the same period.*

Months.	Inches rain fell.	Inches snow fell.	Total inches water.	Number of rainy or snowy days.	Number of thunder- storms.
January	50.	24.	2.40	7	.....
February	6.63	4.	7.	12	.....
March	10.75	6.	11.25	14	1
April	3.13	.....	3.13	11	1
May	4.88	.....	4.88	13	.....
June	1.20	.....	1.20	5	.....
July	5.60	.....	5.60	15	.....
August	4.90	.....	4.90	10	.....
September . . . . .	.75	.....	.75	4	5
October	4.80	.....	4.80	12	.....
November	1.4	1.	1.5	9	.....
December	1.9	18.5	3.5	16	.....
	46.7	47.5	50.91	128	7

The observations show a freedom from heavy thunderstorms and violent winds which prevail further westward. The prevailing winds during the year were west and southwesterly; next most frequent were easterly winds.

TABLE IV.—*Monthly Mean Temperature at Marietta, Ohio, during the last Eleven Years.* By GEORGE O. HILDRETH, M. D.Latitude of Marietta, $39^{\circ} 25'$.

Months.	1857.	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.
January	19° 10	10 44	33° 00	32° 66	32° 33	35° 31	31° 01	28° 25	24° 22	20° 36	20° 70
February	42.73	28.00	37.77	35.00	38.20	33.66	35.85	32.57	32.69	30.53	28.18
March	37.91	40.70	48.48	44.13	43.00	40.19	37.17	36.81	45.76	39.07	36.50
April	42.88	54.70	52.03	54.30	52.70	51.11	48.94	48.65	55.12	45.84	52.60
May	56.95	60.70	67.20	65.50	56.39	59.56	62.04	61.38	59.92	57.32	51.83
June	70.30	72.70	67.23	68.03	70.25	65.90	63.12	68.18	73.64	68.67	70.27
July	74.44	75.20	74.23	73.68	68.17	72.71	73.16	74.09	71.70	74.69	71.81
August	72.33	72.13	72.10	72.23	71.00	73.40	73.98	73.10	69.77	66.25	71.02
September	66.75	64.33	63.51	62.10	60.00	68.34	62.88	63.62	71.30	63.42	67.16
October	52.33	56.00	49.12	62.17	44.20	54.97	49.86	49.90	51.32	53.14	52.68
November	40.37	38.80	45.50	40.29	41.33	40.84	45.91	42.95	41.33	41.54	42.77
December	41.20	40.64	30.48	30.13	37.00	35.52	36.92	32.44	35.98	29.47	31.74
Mean for year . . .	51.43	53.75	53.38	53.35	51.71	52.62	51.91	51.00	52.73	50.74	50.86

TABLE V.—*Monthly Fall of Rain, including depth of Melted Snow, at Marietta, Ohio, during the Eleven Years ending with 1867.* By GEO. O. HILDRETH, M. D.

Latitude of Marietta, 39° 25'.

Months.	1857.	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.
	inch's	inch's	inch's	inch's	inches						
January	1.55	1.66	3.10	3.25	2.704	7.373	6.639	1.405	3.85	3.909	2.980
February	1.50	3.41	7.20	1.25	2.316	2.816	2.768	2.076	2.957	3.448	5.272
March	1.30	1.00	5.08	1.08	2.278	3.392	4.030	4.041	5.840	3.912	5.853
April	3.08	5.00	6.46	5.30	6.372	7.674	1.934	3.542	3.467	3.874	2.498
May	5.16	12.42	1.56	2.88	5.619	3.783	1.982	4.172	8.085	0.949	6.042
June	4.08	3.09	4.62	2.01	3.961	2.527	2.135	2.024	4.968	4.563	2.740
July	4.87	5.33	1.08	5.87	5.140	3.924	3.223	1.950	5.887	4.519	5.048
August	5.21	7.42	4.46	4.14	3.031	3.641	1.944	7.575	3.302	4.159	4.060
September	1.63	1.37	4.95	3.26	4.312	7.285	2.341	3.132	3.951	7.700	0.602
October	2.58	7.36	2.79	4.35	4.433	2.873	4.692	2.845	1.465	2.945	4.470
November	4.84	4.82	2.08	4.01	4.631	2.053	2.807	3.915	1.350	3.520	1.941
December	4.84	8.06	5.17	2.08	1.618	3.072	2.571	4.259	3.734	3.740	5.195
Am't for year	40.64	61.84	48.55	39.48	46.415	42.713	37.066	40.936	48.841	47.269	46.706

TABLE VI.—*Abstract from Register of Deaths for 1866 (Auditor's Report).*

Apoplexy	.	.	.	30	Fever (?)	.	.	.	306
Bowels, inflammation of	.	.	.	26	Heart, disease of	.	.	.	28
Brain, diseases of,	.	.	.	52	Measles	.	.	.	1
Cancer	.	.	.	16	Old age	.	.	.	93
Cold (?)	.	.	.	7	Paralysis	.	.	.	33
Childbed	.	.	.	25	Pneumonia	.	.	.	38
Consumption	.	.	.	279	Rheumatism	.	.	.	9
Croup	.	.	.	94	Scofula	.	.	.	15
Cholera morbus and cholera infantum	.	.	.	61	Smallpox	.	.	.	4
Diarrhoea	.	.	.	57	Unknown	.	.	.	514
Diphtheria	.	.	.	118	Violent or accidental	.	.	.	107
Dropsy	.	.	.	77	Whooping-cough	.	.	.	48
Dysentery	.	.	.	84	Miscellaneous causes	.	.	.	307
Epilepsy	.	.	.	26	Sore-throat (diphtheria?)	.	.	.	4
Erysipelas	.	.	.	21	Total	.	.	.	2492
Males	.	.	.	.	.	.	.	.	1264
Females	.	.	.	.	.	.	.	.	1228

Returns from all counties except Wayne.

TABLE VII.—*Abstract of Register of Deaths for 1866, showing the number for each month.*

January	.	.	.	.	144	September	.	.	.	233
February	.	.	.	.	192	October	.	.	.	231
March	.	.	.	.	248	November	.	.	.	181
April	.	.	.	.	236	December	.	.	.	178
May	.	.	.	.	203	Date not given.	.	.	.	35
June	.	.	.	.	152	Aggregate	.	.	.	2492
July	.	.	.	.	190					
August	.	.	.	.	271					

TABLE VIII.—*Register of Deaths at Different Ages.*

Under one year . . .	598	From 50 to 60 years . . .	131
From 1 to 5 years . . .	375	" 60 to 70 "	120
" 5 to 10 "	142	" 70 to 80 "	121
" 10 to 20 "	216	" 80 to 90 "	75
" 20 to 30 "	244	" 90 to 100 "	15
" 30 to 40 "	169	over 100 "	3
" 40 to 50 "	122	Age not given . . .	14
The above ages give for infancy . . .	. . .	24.9 per cent.	
" " childhood . . .	. . .	21.3 "	
" " adolescence . . .	. . .	8 "	
" " manhood . . .	. . .	20.1 "	
" " old age . . .	. . .	18.7 "	
The number of marriages for 1866 were . . .	. . .	4325	
Births { Male . . . . .	. . . . .	5464	
Female . . . . .	. . . . .	5066	
		—	10,530

Cholera.—The first epidemic of this disease came to the then town of Wheeling, by steam-boat from Cincinnati in the early part of May, 1833. Several cases had been removed from the steamer; soon after sporadic cases occurred in different parts of the town, and within two or three weeks became generally diffused.

The point of greatest severity was about the “market-space” in the centre of the town. Now this position was at the time in notoriously bad sanitary condition from accumulations of filth; the removal of which the “health officer” had previously urged upon the council; but they refused, until after the epidemic had broken out; then, it was thrown over the river bank, spreading death and desolation in the neighborhood, carrying off at one point thirteen, and at another twenty-three victims.

To test the virtues of coal smoke and heat (in June and July) in staying the epidemic, cart loads of coal were deposited at intervals of fifty yards along each side of the principal streets and fired; the volumes of dense black smoke enshrouding the town—deserted streets, except by the frequent funeral train—sorrow and alarm depicted on every face, formed a scene more easily imagined than described; its impressions are still very vivid in my mind.

The *treatment* at that time was purely experimental; to one case (an old man) the doctors gave teaspoonful doses of calomel; he recovered, but was sorely ptyalized.

The popular mind had great confidence in a large Burgundy pitch plaster worn over the stomach and bowels, as a preventive, so that it came into general use; in proportion to their *faith* in its

virtues, their fears became quieted, and doubtless many cases were prevented.

Our next visitation began in February, 1849; as before, it was brought here by the steamer *Embassy*, from Louisville, Ky. Two of her deck hands were "put ashore," both being well-marked cases, as attested by the whole of our medical faculty. On the 19th of the following May, the first local case occurred in the northern part of the city; within two or three weeks it spread extensively. The last case falling under my care was on 20th October, 1849.

In the following June (1850) it was again introduced by the steamer *Mount Vernon*; very soon afterwards anomalous bowel complaints appeared, and increased in number and severity, until in the latter part of the month, when well-marked cases occurred, until the latter part of September. In 1851 we escaped the epidemic, although violent and fatal cases of cholera morbus were not uncommon.

Cholera broke out again in June, 1854, and continued until the latter part of August. This was the severest epidemic since 1833. During July it was very fatal; the month was extremely dry and hot, until the last ten days, which were marked by three violent storms, occurring on the 20th, 24th, and 29th; no abatement of the extreme heat followed these falls of rain.

It is a remarkable fact, that, during this epidemic, there was, proportioned to the population, a larger percentage of cases in our suburban towns and adjacent farms than in the city.

Our Board of Health reported 68 deaths in July, and 22 in August, from cholera. At that time the average deaths from all causes, before the epidemic, was about twenty a month.

Except along the lines of travel (Baltimore and Ohio Railroad, Ohio and Kanawha Rivers), I do not believe a case of cholera has occurred in the State. Many of our physicians think that it is impossible for it to exist in the mountainous portion.

Our most successful treatment consisted in absolute rest, dry heat, counter-irritation over the stomach and bowels, with small and repeated doses of a combination of calomel, capsicum, and strychnine. Spirits of turpentine and sulphuric acid formed the basis of some prescriptions.

Diphtheria.—The first intimation of this disease among us is noted the last week of June, 1859, some five or six cases in East Wheeling, all children, attended with exudation of false membrane in the fauces, very thick, firm, and of an ash color, typhoid form

of fever, eruption of vesicles over the body, and rapid prostration. From that time until the present our city has not been free from it, and in fact it has prevailed in nearly every other part of the State. In Taylor, Marion, and Harrison counties about three years ago it was especially frequent and fatal.

We have had various forms and complications of this malady, which for convenience may be reduced to three: 1st. Marked by some swelling of the tonsils, with slight redness and several points or dots of grayish color, usually preceded by pain in the back of the head.

2d. Decided redness and swelling of the tonsils and soft palate, which are covered more or less with diphtheritic effusion, attended with difficult and painful deglutition, accompanied by fever, headache, and more or less swelling of the cervical glands.

3d. Swelling and effusion in the fauces and nares, the parts not covered with effusion almost of a livid color; the submaxillary and adjacent glands much swollen, red, hard, and painful; deglutition very difficult; an acrid discharge from the nostrils; fever with delirium and great prostration. Occasionally in the second but more frequently the third variety, about the fourth or fifth day, dyspnoea supervenes, and croupal cough with the expulsion of false membrane-casts of the bronchial tubes, which I have seen from two to nine inches in length.

This membrane proves on microscopical examination to be composed of a "fibrinous basement, interspersed with exudation corpuscles;" it is firm and elastic.

There is scarcely a doubt that persons of serofulous constitution are more seriously affected by the disease, and more liable to its invasion.

We think this disease is conceded by the profession to belong to the class of blood poisons, the intimate nature of which we cannot explain; we consider it infectious. Its sequela are paralysis, albuminuria, neuralgia, croup, bronchitis, etc.

Our most reliable *treatment* has been the free use of chlorate of potassa, tinct. ferri chloridi, muriate of ammonia, warmth and nourishing diet for the milder forms, and in the grave or malignant variety, in addition, quinine, milk-punch, carbonate of ammonia, beef-tea, lime-water inhalations, etc., under all of which the patient will generally die. The deaths from diphtheria in the State for 1866, were 118, most probably less than the actual number.

Consumption.—The majority of the inhabitants of West Vir-

ginia being engaged in agricultural pursuits, are placed under hygienic conditions unfavorable to the development of this disease.

From the best data within reach, we should judge that one-third of the mortality of the State reported for the year 1866, happens in the manufacturing districts. The returns show one death for every 1433 inhabitants.

An idea of phthisis pulmonalis, not fully in accordance with my own views, has recently been published in the *London Lancet*, by William Budd of the Bristol Royal Infirmary, viz., "that phthisis is a self-propagated zymotic disease, and that all the leading phenomena of its distribution may be explained, by supposing that it is disseminated through society by specific germs contained in the tuberculous matter cast off by persons suffering from the disease," among his *reasons* for this conclusion are the following: (d.) "Its much greater *prevalence in low levels* and among crowded communities, and its *entire absence*, unless by casual importation, at *very high levels*, conditions which are well known to rule in the same directions, the spread of zymotic diseases generally, and especially of that group in which, as in phthisis, the morbid matter is cast off in a liquid form."

Scarlatina.—Our northwestern in common with other parts of the State have been serious sufferers from this fatal disease. We remember when our old physicians called it "French measles," its then common name. In the early part of the present century a company of French emigrants settled the present town of Gallipolis, Ohio, and brought this disease into the western part of the country. From this point it spread among the adjacent settlements, and was not at that time distinguished from measles (rubeola) except by its severity and fatality; hence the name.

We have had the usual forms of simple, anginose, and malignant.

The first endemic we will notice occurred in the winter of 1849–50. It was severe and fatal.

It will be remembered that our visitation of cholera had been during the preceding summer, and what influence this may have had in determining its type is hard to decide; but the symptoms rapidly succeeding the chill, were vomiting and purging, and a condition not unlike the collapse of that disease, but soon followed by reaction and the appearance of the characteristic eruption, with fever, delirium or coma, great swelling of the fauces, with ulceration or sloughing, rapid prostration, and death.

During March, 1850, it still prevailed, but assumed a *mild type*, needing little or no medication. The maximum temperature of this month was 64° Fahr., mean 41°.1, minimum 14°. Rainy and snowy days 9, cloudy 12, fair 10. Winds N.W. by N. 13 days, S.W. 8 days. These facts are stated to assist one more competent to explain such results.

Scarlatina was endemic here (Wheeling) again in 1854. Cholera was prevailing at the same time (July and August).

The points to be noticed are its malignant type and great liability to be followed by dropsy and swelling and suppuration of the cervical glands.

There was nothing new in the *treatment*, the usual unsatisfactory routine of tonics, stimulants, and local applications were prescribed.

On examining the bills of mortality of this city for the last twenty years, we find this part of the State to have been scarcely free from scarlet fever; but why its type should be mild one season and malignant in the next, or the same season it should markedly change its type, are queries which we have vainly endeavored to solve.

Fever.—Under this head are included intermittent, remittent, and typhoid fevers.

In the early history of Western Virginia, especially along the valley of the Ohio River, intermittents occurred as regularly as the fall months, and along with them bilious remittent; in fact, the former "run into" the latter, and the latter as commonly terminated in the former. Most of the Ohio River bottoms at that period contained swamps and low wet grounds, which during the last twenty years have been drained, which no doubt has in a great measure done away with this class of fevers.

Our bilious remittents were announced by lassitude, loss of appetite, rigors, headache, followed by vomiting of bilious matters, intensely bitter taste, tongue furred, yellow or brown, and hot fever, attended with remissions and exacerbations. The danger of the attack was due to *inflammatory complications* of the head, chest, or abdomen. The remedies universally adopted were bleeding, emetics, mercurial purgatives, nitrous powders, and quinine, under which ninety-five per cent. recovered.

The prominent idea in the minds of most physicians in treating it was, that if the "gums were touched" the patient would almost surely recover, and experience proved its truth. Now this *biliousness* often attended other complaints, in fact, its impress was

upon a majority of diseases, requiring especial attention before convalescence could be established; so that we remember hearing an old physician remark "that if a man should break his leg, he would grow bilious before it united."

Soon after the advent of cholera in 1849, *typhoid symptoms* appeared, and in a short period, typhoid or continued type of fever usurped the place of the old bilious remittent, and has continued to hold absolute sway up to the present hour. The apparent tendencies are that *it* will have to give place before many years to true typhus.

With the change of type came the necessity of a radical change of *treatment*. The *lancet* was sheathed, and has grown rusty in its case. We have not known or heard of a patient being *bled* for probably fifteen years; and as for bleeding in the present form of fever, it is never practised.

The supposed or real effect of mercurials diminishing or dissolving the fibrin of the blood, has thrown them out of the therapeutics of this fever. Some practitioners are still anxious to "correct the secretions."

Typhoid fever with us has presented the same symptomatology and pathology clearly and fully described by others. We judge the views of a majority of our profession are in favor of its infectious character.

The *treatment* is regulated by the mildness or gravity of the attack. In the milder forms, tinct. ferri chloridi, with nourishing animal broths and careful nursing, will carry a large proportion of cases to a good convalescence in from two to five weeks.

In the graver forms, where the force of the poison appears to be spent on the brain and nervous system, marked by feebleness and frequency of the pulse, continued delirium, cramps, or rigidity of the extremities, the chief reliance has been upon the strongest stimulants, among which spirits of turpentine and brandy fulfil the indications best. We remember two cases of this character, one of which drank nine gallons, by estimate, of fourth proof French brandy in eight days; and the other, about five gallons in the same period; they recovered from both fever and brandy. The former patient on the eighth day became quite drunk, and his potations were stopped. This happened about ten years ago: they are both in good health at this writing.

In cases where great frequency of the pulse is a prominent symptom, veratrum viride and quinine, added to the stimulation,

produce favorable results. Chlorate of potassa is also a favorite prescription.

The return by the registry of the State,¹ of deaths from fevers is 306.

Dysentery.—This disease, to a greater or less extent, is our annual visitant during August, September, and October. It is more prevalent in the rural districts. An old practitioner remarked as the result of his observation, that it was most apt to occur, and more fatal, among the inhabitants of the "white oak lands;" these lands are along the ridges of our hills, having a clayey and calcareous soil. By the latter part of summer, or early fall, particularly if the season has been a dry one, the springs and wells either nearly fail or dry up; their sensible and chemical qualities become changed, containing double the quantity of the salts of lime, and often sulphuretted hydrogen gas; thus rendering their taste nauseous and unpalatable, and inducing more or less griping and purging when drank. Farmers and others working in the open field under a hot sun, perspiring copiously during the day, with cool dewy nights, and drinking the water described all the time, have sufficient provocation for dysentery.

Full doses of opium, sufficient to remove the tormina and tenesmus, followed by mild mercurial cathartics, generally cure it.

TOPOGRAPHY OF THE CITY OF WHEELING.—Wheeling is situated in latitude $40^{\circ} 7'$ north by longitude $80^{\circ} 42'$ west, in Ohio County, West Virginia, on the east bank of the Ohio River.

Its average altitude is 640 feet above the sea level.

The original town was laid out in 1792 by Col. Ebenezer and Jonathan Zane, on a plateau elevated some 80 or 90 feet above the level of the river; there is a declivity of some 40 feet in this plateau, to the level of the "river bottom" proper, upon which two-thirds of the city is built. The general elevation of the "river bottom" is 40 feet above low water.

The eastern boundary is flanked by hills having a mean altitude of about 700 feet.

Wheeling Creek, taking its rise in Greene County, Pennsylvania, and having a very tortuous course, flows along the eastern, and by an abrupt curve around the southern base of Wheeling Hill, emptying into the Ohio near the centre of the city.

¹ Auditor's Report.

The lowest points are subject to inundation during high floods of the river. Opposite the city is Zane's Island, about one mile in length, with an area of about 400 acres; it is connected with the main land by a wire suspension bridge having a single span of 1010 feet.

The original town has received many additions, besides the villages of Clinton, Fulton, Manchester, Columbia, and La Grange adjoining it, and Martinsville, Bridgeport, Kirkwood, and West Wheeling along the opposite side of the river.

Its length along the river is about four miles, with an average breadth of one-fourth of a mile.

The streets have a good width, are laid out at right angles to one another; those on the hill-side have a rapid drainage, while the more level portions are provided with sewers. The houses are mostly built of brick.

The supply of water is drawn from the river by forcing it into a "basin" at an elevated point on the side of Wheeling Hill, and from thence is distributed over the city through iron pipes.

The present population is 20,254, made up of representatives of most of the European nations, with some descendants of the first settlers; they are an active, industrious people, devoted chiefly to manufactures, of which iron, nails, and glass are the chief. The "iron mills" alone give employment to about 2000 persons.

The forest trees have been removed from the "tops" of the adjacent hills, and but few are left on their sides.

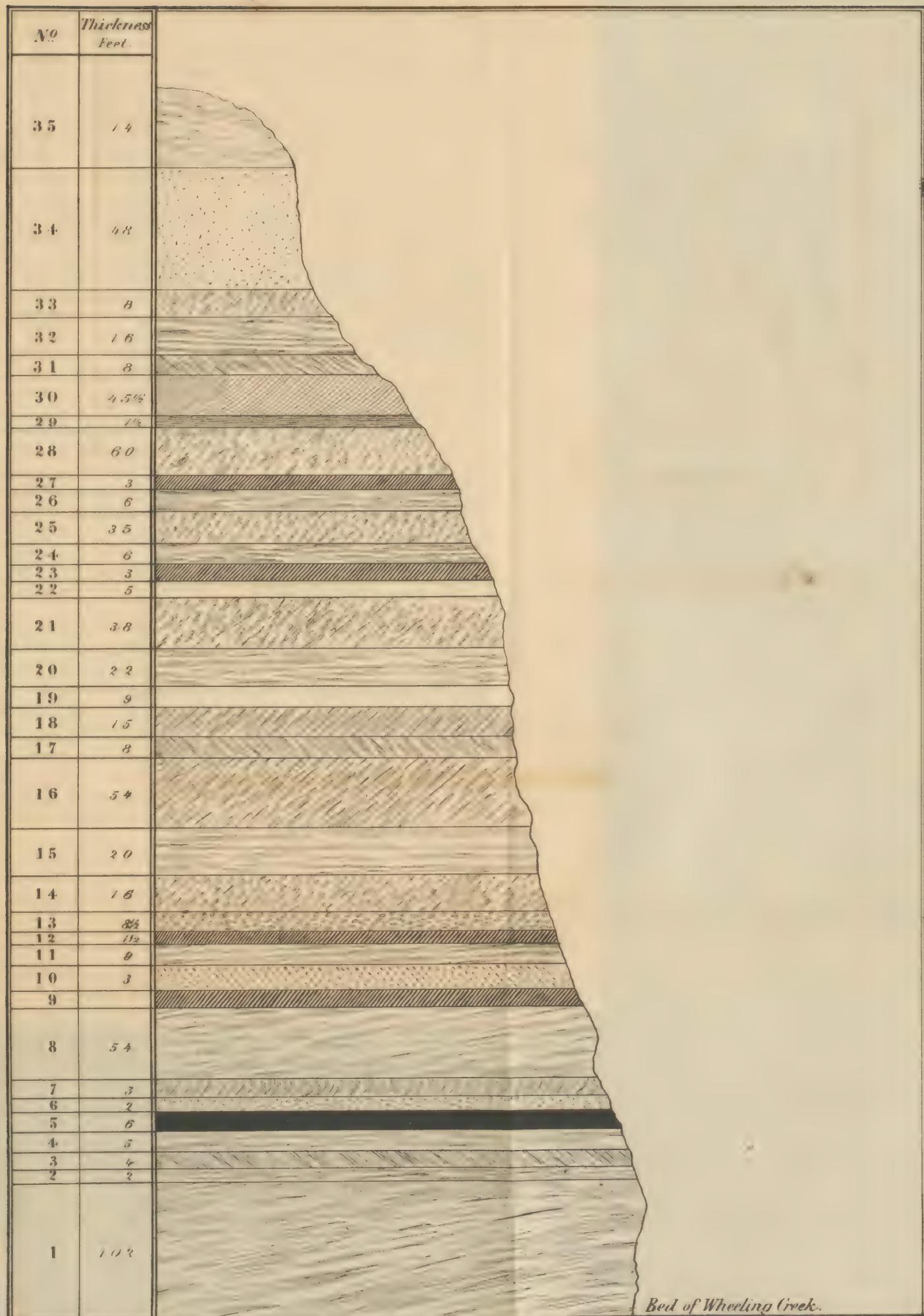
In making the following section I was accompanied by Mr. Ed. Bocking and Dr. B. W. Allen, of this city.

SECTION OF ROCK STRATA OF "CHAPLINE'S HILL," ORDER ASCENDING.

Bed of Wheeling Creek is formed of magnesian limestone, containing fossils; depth of strata unknown. The dip of all the strata is southeast, 12.07 feet per mile.

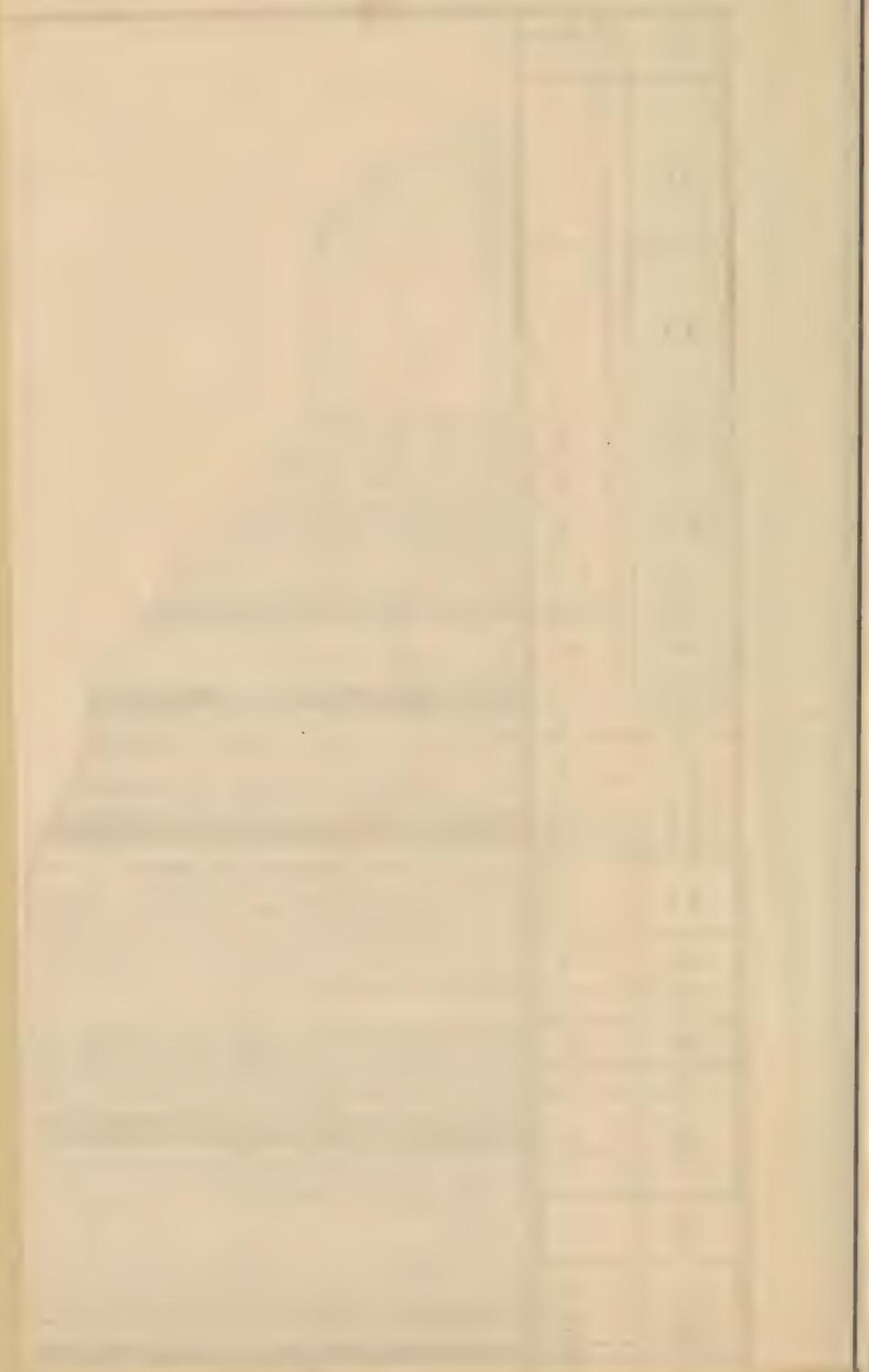
1. Sandstone, used for building purposes in this city; the new Episcopal church is built entirely of it, and the front of the new Methodist church: in our sulphurous atmosphere it is liable to disintegrate in consequence of its containing pyrites; the upper half of the strata is loose, the lower part presents about 24 feet of solid face; 102 feet.
2. Concrete stone, nodules of carbonate of lime, with crystals of same, very hard, of bluish color; 2 feet.
3. Nodular mass of sandstone, with iron and yellow clay; 4 feet.
4. Blue clay, intermixed with boulders of limestone; 5 feet.
5. Bituminous coal; this is the chief vein; worked easily from the face of the hill by horizontal openings and "tram railroads" to carry it directly to the iron furnaces; the "top or clean coal" is very pure, of about 2½ feet depth; the lower part of the vein is traversed by several seams of "slate," composed of sulphuret of iron, which, on being collected in beds or masses and exposed to the action of air or oxygen and moisture, becomes sulphate of iron or copperas; there are some few fossil ferns to be found, but they are very rare in this coal measure; fourteen miles above Wheeling this vein reaches the top of the river hill, and six miles below dips under the bed of the river; 6 feet.
6. Soapstone, forms the "roof" of the coal banks; 2 feet.
7. Blue clay, used as fire-clay about the "furnaces;" 3 feet.
8. Limstone, stratified: colors, white, blue, and gray; this is the seam from which our lime for building purposes is made; I learn in a recent trial of various kinds of lime, by the Baltimore and Ohio Railroad Company, for the purpose of building bridges and tunnels, they prefer this lime; it is semi-hydraulic; with coarse gravel, etc., it forms a very durable concrete: a number of houses have been built of this composition; 54 feet.
9. Bituminous shale, disposed in very thin layers; 3 feet.
10. Sandstone, in strata from 2 to 10 inches thick; fine oxide of iron precipitated on it; 9 feet.
11. Limestone, yellow color, soft, disintegrates readily; 9 feet.
12. Bituminous shale, contains sulphuret of iron; 1½ foot.
13. Clay slate, bluish color, very soft; 8½ feet.
14. Sandstone, disposed in layers of different thickness, with oxide of iron deposited on surface; used for flagging; 16 feet.
15. Limestone, dark blue color; conchoidal fracture; makes excellent lime; 20 feet.
16. Limestone, strictly part of the strata below; contains seams of different colors, white, yellow, and blue; 84 feet.
7. Sandstone, fine-grained and hard; greenish color; 8 feet.

Order of Stratification of Chaplines Hill
 (adjoining Centre Wheeling.) **order ascending.**



Bed of Wheeling Creek.

686 feet.



18. Limestone, interspersed with crystals of carbonate of lime; yellow color: soft; 15 feet.
19. Sandstone, olive-green color; fine-grained and very hard; 9 feet.
20. Limestone, upper portion of strata filled with boulders containing carbonate of iron; 22 feet.
21. Sandstone, gray color; loose stratification; many fissures, out of which springs of good water flow; 38 feet.
22. Limestone, dark-blue color; very hard; 5 feet.
23. Bituminous shale, coated with iron rust; 3 feet.
24. Limestone, brown color; 6 feet.
25. Sandstone, coarse; soft; gray color; stratified; 35 feet.
26. Limestone, dark brown, with crystals of carbonate of lime; 6 feet.
27. Cannel coal, 18 inches workable; this seam, seven miles east, is near the base of the hills, where, several years ago, "oil" was distilled from it; but the discovery of petroleum made it unprofitable, and the works were abandoned. In early times it was called "black rock" by the settlers, one of whom built a chimney for his cabin out of it; but on lighting his fire, both house and chimney were consumed; he cursed the "black rock," and said it would not do for chimneys; 3 feet.
28. Sandstone, in seams of from one to six inches thick; greenish color; micaceous; 60 feet.
29. Bituminous shale, springs issue from its base; $1\frac{1}{2}$ foot.
30. Sandstone, gray, micaceous; $4\frac{1}{2}$ feet.
31. Limestone, light blue, hydraulic; 8 feet.
32. Sandstone, micaceous, with carbonate of iron; 16 feet.
33. Limestone, snuff color, with veins of crystallized carbonate of lime; 8 feet.
34. Sandstone, coarse-grained, soft; contains mica and iron: forms base of soil; 84 feet.
35. Yellow clay, formerly covered with oak, hickory, beech, poplar, walnut, etc.; 14 feet.

In the following tables the temperature of the air was observed three times a day, at the hours 7 A. M., 2 P. M., and 7 P. M.; expressed in degrees of Fahrenheit's scale. My record relates to the indications of the thermometer, direction of the wind, depth of rain and snow, state of the sky, occurrence of thunder storms, frost, hail, auroras, etc. The thermometer was suspended about five feet above the ground, and protected from radiation.

E. A. HILDRETH, M. D.

WHEELING, WEST VIRGINIA.

TABLE VIII.—*Observed Mean Monthly Temperatures at Wheeling,
W. Va. By E. A. HILDRETH, M. D.*

Year.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Mean Annual.
1848	...	...	...	...	...	70°.34	72°.60	72	69.16	52°.00	39°.00	...	...
1849													
1850	28°.48	31°.19	41°.16	48°.50	55°	75.66	76.60	76.80	68.60	52.70	50.00	37°.00	53°.75
1851	35.50	39.30	...	...	...	...	73.	73.	70.66	52.50	...	...	...
1852	26.09	34.11	36.08	48.34	59.	70.	74.5	...	...	...	...	...	...
1853	...	...	...	...	...	...	...	...	...	...	...	...	...
1854	28.93	32.01	37.67	49.26	60.93	71.33	81.67	78.33	70.16	50.42	39.	31.69	52.92
1855	35	25.14	35.50	35.89	62.	64.82	78.33	74.32	70.	49.32	44.67	33.67	51.79
1856	19.50	24.66	29.23	50.66	61.54	74.	77.	68.	64.	48.	40.33	28.66	48.80
1857	17.33	40.80	37.30	46.16	55.33	67.	72.40	68.35	64	49.	39.	37.22	49.
1858	38.	26.80	38.35	52.40	59.34	73.60	81.16	73.	65.67	56.16	38.70	38.	53.43
1859	30.	35.72	45.22	45.60	68.26	64.35	71.34	70.34	62.32	48.16	40.11	30.	50.70
1860	32	32.66	40.10	50.20	65.67	67.90	68.52	73.21	64.90	52.65	41.76	31.52	51.59
1861	30.67	38.30	38	52.	57.40	73.58	70.	74.62	62.63	53.12	42.68	37.50	52.54
1862	33.84	33.	40.70	51.	57.50	64.60	74.33	84.34	62.33	51.48	41.30	38.33	52.73
1863	34.22	35.83	38.53	44.80	64.18	64.11	76.33	72.	61.10	51.20	44.27	32.66	51.60
1864	29.44	33.91	36.45	45.33	60.70	68.60	74.85	75.33	61.72	49.86	42.80	32.45	50.95
1865	23.92	30.12	44.16	53.50	59.33	73.77	74.71	69.39	71.79	42.41	40.83	38.	51.83
1866	29.50	29.28	38.64	55.66	56.33	68.82	74.06	68.67	64.86	54.86	41.33	31.53	51.16
1867	20.19	39.	37.76	54.50	58.55	73.06	76.	76.06	69.63	52.30	45.32	31.88	52.14
Month. mean	28.97	33.05	38.43	49.75	60.06	69.77	73.91	73.43	65.56	50.95	41.96	34.01	51.64

Table N° 9.

DIAGRAM

Annual Fluctuation of Temperature (Average of 16½ years.)

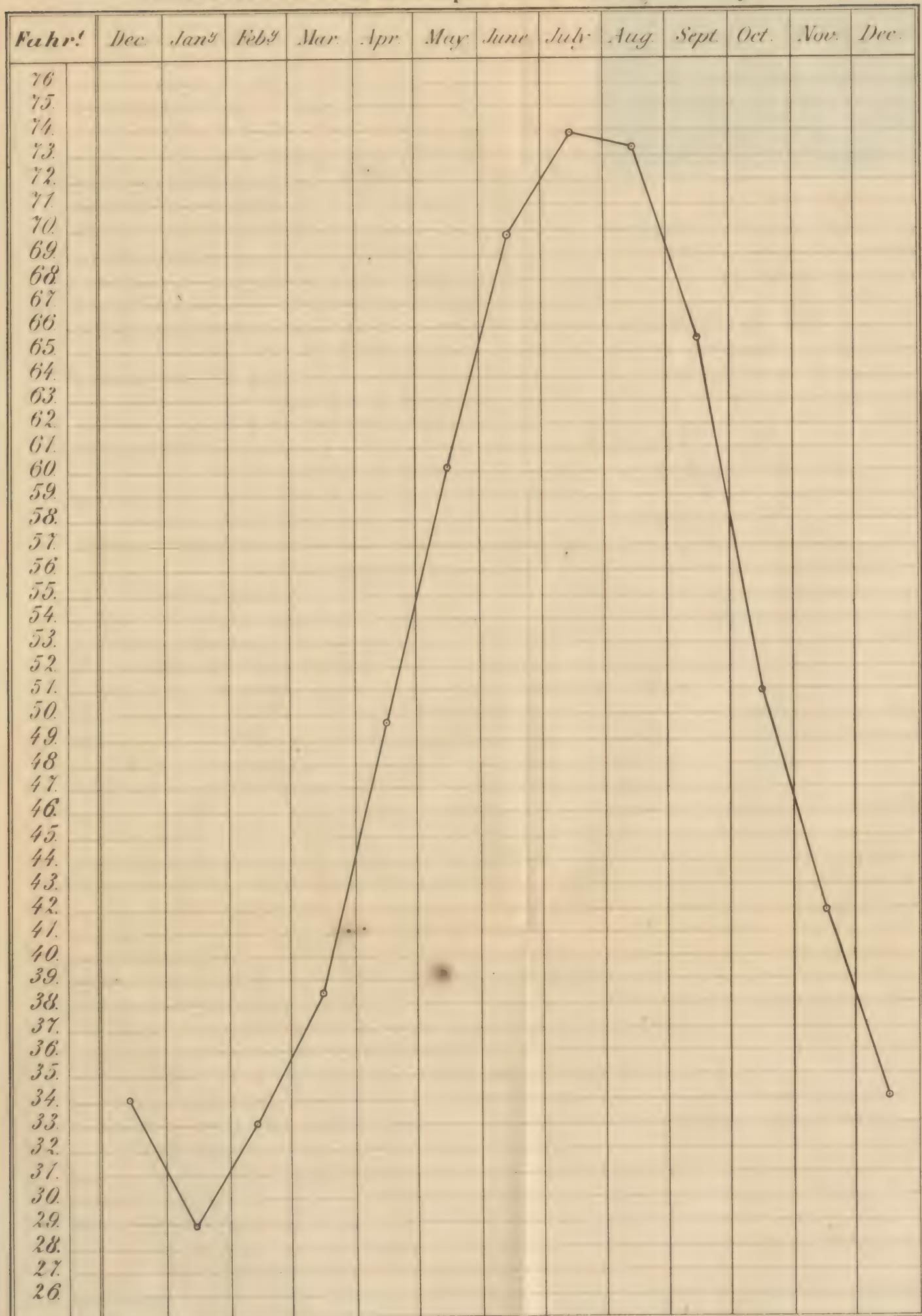




TABLE X.—*Highest Temperature observed in each Month.*

Year.	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1848	92°	89°	91°	82°	75°	60°	...
1849
1850	64°	80°	79°	90.5	95	90	85	74	66	58°
1851	.	57°	62°	...	...	...	92.5	86	94	75	...	...
1852	.	48	51	59	74	83	86	94	...	...	...	...
1853
1854	90	104	95	97	70	52	56
1855	.	56	46	48	86	82	94	92	90	86	68	58
1856	.	37	44	50	81	85	99	96	87	88	74	63
1857	.	42	60	68	70	82	89	91.5	91	86	68	72
1858	.	60	50	69.5	78	80	95	97	94	87	86	60
1859	.	55	60	72	72	84	92.5	94	90	78	70	69
1860	.	53	64	68	78	89	90	89.5	92	85	78	73
1861	.	46	68	70	80	82	91	91	95	84	78	62
1862	.	57	51	70	82	82	82	93	90	82	80	68
1863	.	52	47	60	70	80	92.5	92	94	86	72	65
1864	.	62	60	52	58	80	95	96.5	96	75	79	60
1865	.	38	42	70	74	82	96	96	90	89	72	68
1866	.	65	69	69	80	78	92	102	84	80	76	60
1867	.	36	55	56	72	82	92	98	92	91	80	72
Monthly means	51	57	63	75	82	91	94	91	85	75	64	59

TABLE XI.—*Lowest Temperature observed in each Month.*

Year.	Jan.	Feb.	March	April	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1848	46°	60°	56°	40°	33°	28°	...
1849
1850	14°	29°	44°	53	67	62	55	40	28	22°
1851	.	4°	10°	...	...	...	65	62	40	30	...	...
1852	.	-13	10	14	32	40	50	52	...	...	...	...
1853
1854	50	60	50	50	38	28	8
1855	.	14	8	20	27	40	45	60	60	47	38	25
1856	.	-15	-12	-7	32	39	57	54	48	37	32	22
1857	.	-10	9	7	22	34	52	52	50	44	32	9.5°
1858	.	26	-2	2	31	45	49	62	48	40	39	18
1859	.	1	16	22	24	45	37	50	45	43	30	24
1860	.	0	3	20	27	39	51	53	49	36	34	10
1861	.	11	0	12	32	32	50	52	50	40	30	28
1862	.	5	15	16	35	39	50	59	60	39	30	26
1863	.	6	3	16	20	45	45	62	46	45	32	17
1864	.	-10	0	12	34	38	45	48	52	46	32	6
1865	.	-2	-2	16	32	35	56	50	55	50	32	29
1866	.	-4	-5	14	32	33	50	56	52	45	36	9
1867	.	-9	25	8	38	35	52	52	57	38	32	8
Monthly means	-2.66	5.2	12.4	24	38.8	49.3	56	53	43	34	22	11.6

TABLE XII.—*The Frequency of each Wind recorded three times a day during twelve years—11,380 observations.*

	S.	N.	W.	E.	S. W.	N. E.	N. W.	S. E.
January . . .	35	305	80	...	275	...	295	10
February . . .	25	125	40	...	340	...	240	45
March . . .	20	295	85	15	350	5	370	25
April . . .	20	215	80	15	360	...	400	50
May . . .	5	150	115	10	430	...	270	20
June . . .	30	110	75	...	550	...	170	20
July . . .	20	65	230	...	545	...	215	15
August . . .	25	70	45	15	440	...	235	10
September . . .	...	100	85	...	375	...	215	25
October . . .	50	115	50	...	435	...	210	5
November . . .	15	130	15	...	340	...	330	35
December . . .	35	110	35	...	300	...	360	5
Year . . .	280	1790	935	55	4740	5	3310	265

The force of the winds is not noted. The great prevalence of the S. W. and N. W. winds are easily observed as well as the infrequency of the easterly winds. The situation of our city in this part of the Ohio valley, flanked on the east by the Alleghany range of mountains, with a comparatively open country on the west and north, would appear sufficient reason for this result. When violent S. E. storms occur on the Atlantic coast south of us, they are seldom felt here.

TABLE XIII.—*Atmospheric Precipitation.*
Number of Rainy and Snowy Days.

Year.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1848	...	...	...	...	...	9	15	11	5	10	10	...	...
1849	...	...	...	...	...	...	...	...	...	...	...	...	...
1850	...	...	9	13	3	11	9	8	7	7	10	16	...
1851	7	10	...	...	...	...	7	4	9	5	...	...	...
1852	19	10	12	18	7	8	4	...	...	...	...	...	...
1853	...	...	...	...	...	...	...	...	...	...	...	...	...
1854	...	...	...	...	...	5	6	5	3	6	5	10	...
1855	9	12	8	5	7	9	14	11	10	6	11	12	114
1856	12	11 ^s	8 ^s	6	10	7	5	6	7	5	5	5	87
1857	14	8	9	9	10	17	15	12	4	10	14	13	135
1858	7	9	6	15	20	8	9	13	3	11	16	17	134
1859	12	12	16	18	10	14	7	12	11	8	7	11	138
1860	11	9	9	13	16	8	12	10	10	10	12	11	131
1861	13	12	14	13	10	7	15	6	7	5	11	3	116
1862	17	12	14	11	7	10	7	6	3	9	8	12	115
1863	18	14	10	11	6	8	11	8	6	7	11	8	118
1864	8	12	9	12	11	6	6	9	15	13	16	20 ^s	137
1865	15	8	15	13	14	8	10	8	6	9	3	13	12 ^s
1866	7	6	14	6	4	9	8	5	10	5	6	10	90
1867	11	8	8	8	9	10	9	6	none	4	7	14	94
Monthly av.	11.8	10.2	10.7	11.4	9	9	9.4	8.2	6.5	7.6	9.5	11.6	

Average number rainy and snowy days in thirteen years, 117.77

TABLE XIV.—Number of Cloudy and Fair or Clear days.

Average of cloudy days for thirteen years 77.15
 " " of clear " " " " 172.3

TABLE XV.—*Perpendicular Depth of Rain and Melted Snow (in inches).*

	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Aggre-gate for year.
1848	...	...	...	...	...	3.80	7.00	4.60	0.85	1.40	2.20	...	...
1855	1.44	1.55	2.35	.90	1.40	4.01	6.16	2.85	4.10	.78	4.10	2.20	31.84
1856	3.70	1.88	.90	2.25	3.25	3.00	.80	1.25	1.05	1.10	1.75	2.10	23.03
1857	7.10	1.15	.15	.20	3.70	3.60	4.05	4.15	3.50	3.30	1.45	3.25	36.60
1858	.70	1.50	.25	3.98	6.85	5.40	2.65	3.95	.80	3.00	3.85	6.05	38.98
1859	1.80	4.45	3.45	6.20	3.55	4.75	2.50	2.31	4.50	2.00	1.50	5.55	42.05
1860	3.70	1.20	.50	7.50	4.17	1.95	3.65	3.10	1.10	1.90	2.00	1.30	32.07
1861	1.50	1.20	.75	2.20	2.00	1.80	4.35	3.65	4.00	3.00	4.95	.60	30.00
1862	4.33	4.75	3.30	3.70	3.85	8.50	3.05	1.30	1.50	.72	2.35	1.85	39.20
1863	2.18	3.11	1.10	2.45	.95	2.20	2.80	1.40	1.65	2.24	1.85	1.35	21.48
1864	1.60	1.10	2.60	2.47	3.45	3.25	4.35	5.30	6.15	1.75	2.75	2.85	37.62
1865	.71	3.90	3.15	1.90	4.10	2.60	3.20	2.55	3.20	1.45	.50	2.30	29.46
1866	2.13	.30	2.45	.90	.35	3.15	2.30	4.75	5.30	2.75	3.35	2.65	30.38
1867	1.23	1.65	1.85	2.03	2.60	1.60	3.00	3.40	n. m. n.	2.25	1.00	1.90	22.51

Monthly av. | 2.42 | 1.92 | 1.75 | 2.82 | 3.09 | 3.54 | 3.56 | 3.18 | 2.70 | 1.97 | 2.40 | 2.61 |

Average for thirteen years 31.17

TABLE XVI.—*Showing the Annual Mortality of the City of Wheeling for Ten Years, and from what Diseases.*

	1854.	1855.	1856.	1861.	1862.	1863.	1864.	1865.	1866.	1867.
Bronchitis . . .	...	2	2	1	5	5	6	3	6	...
Cholera infantum . . .	46	33	27	15	24	30	24	25	16	10
Cholera morbus . . .	15	...	4	3	4	2	4	2	5	3
Cholera . . .	102	...	...	...	...	...	...	...	...	...
Consumption . . .	45	51	58	41	36	35	37	37	29	34
Convulsions . . .	36	46	33	28	34	28	31	28	13	23
Congestion of Brain . . .	5	8	14	1	8	4	2	4	2	9
Croup . . .	4	7	15	5	6	7	7	1	5	4
Diarrhoea . . .	28	15	7	8	7	5	7	10	...	1
Diphtheria . . .	...	...	1	22	20	22	...	7	3	2
Disease of heart . . .	17	6	7	2	2	4	8	4	6	8
Dropsy . . .	19	17	2	10	10	6	...	8	11	6
Dysentery . . .	12	7	2	1	2	9	7	5	3	2
Fever, scarlet . . .	31	39	8	18	39	18	32	31	2	1
“ typhoid . . .	40	35	10	9	35	14	29	42	7	4
Whooping-cough . . .	...	21	2	3	2	4	...	4	...	7
Inflammation, bowels . . .	26	7	30	21	15	7	15	14	15	10
“ chest . . .	28	24	3	37	29	32	36	26	16	33
“ brain . . .	9	3	12	8	...	30	17	15	6	8
Marasmus . . .	20	12	11	9	12	11	11	23	9	8
Measles . . .	15	2	...	5	4	6	18	4	...	...
All other causes . . .	176	200	118	99	100	110	153	150	158	149
Total annual mortality .	674	535	367	346	394	389	444	443	311	322
Ages—1 to 10 years .	372	359	217	202	243	238	217	233	160	175
Adult age . . .	302	176	150	144	151	151	227	210	151	147

TABLE XVII.—*Showing the Deaths in the City of Wheeling for Seven Years, for each Month and Season, with the Annual and Total Deaths.*

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1861	28	30	36	31	28	25	41	24	30	24	28	21	346
1862	32	27	39	34	32	36	58	41	23	33	15	24	394
1863	31	25	33	30	38	25	20	52	29	25	37	44	389
1864	28	25	36	45	37	42	50	46	39	37	29	30	444
1865	31	32	49	36	32	50	56	41	36	25	25	32	445
1866	31	32	25	30	20	19	27	29	22	27	26	23	311
1867	28	35	22	31	18	33	31	27	25	17	25	30	322
		206*	209*										
				240	237	205							
Total for spring	.	.	682										
						230	283	260					
Total for summer	.	.	.	.	.	773							
							204	188	185				
Total for fall	.	.	.	.	.	.	577						
								204					
									203*				
									209*				
Total for winter	.	.	.	.	.	.	.	.	.	.	619		
Average each season for 7 years, per cent.	97.6			110.4			82.4		88.4				
Average annual mortality	.	.	.	.	.	378.7							

STORMS IN TWELVE YEARS.

Number and Distribution during the Year.—The whole number for twelve years is 95, as follows:—

Storms accompanied by lightning and thunder—

January . . . 0	February . . . 1	March 2
April 5	May 13	June 16
July 12	August 10	September . . . 4
October 2	November . . . 1	December . . . 0

Snow Storms.

January . . . 5	February . . . 5
April 2	November . . . 1

Rain Storms.

March 6	April 4	September .. 2
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Hail Storms.

March 1	May 2	August 1
-----------------	---------------	------------------

Frost occurred every month in the year; the latest average time in spring is 26th May; and the earliest average time in fall is 23d September.

Aurora Borealis occurred during the twelve years only twice, August 28, 1859, and September 2, 1859.

